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## *KEEPING THE FORWARD SURGICAL COMPANY IN TOP CONDITION: EVALUATION OF BIOMEDICAL EQUIPMENT TEST AND REPAIR AMALS*

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**KEEPING THE FORWARD SURGICAL COMPANY IN TOP CONDITION:  
EVALUATION OF BIOMEDICAL EQUIPMENT TEST AND REPAIR AMALS**

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## **SUMMARY**

### **Problem**

Operational Maneuver From The Sea (OMFTS) is a US Marine Corps and Navy doctrinal concept that describes military operations characterized by rapid tempo, momentum, and flexibility. Such operations require a medical support system that can keep pace with the speed and mobility of assault forces. To accomplish this objective, the logistical footprint of the surgical company (SC) must be reduced without compromising the quality of clinical care rendered.

### **Objective**

The test and repair (T&R) function must keep pace with changes to the biomedical equipment in patient care and clinical support areas of the SC. The equipment carried in the battalion aid station, Shock Surgical Team/Triage, acute care ward, operating room, lab, x-ray, pharmacy, and dental blocks determines what is needed for the biomedical equipment T&R blocks. The purpose of evaluating Authorized Medical Allowance List (AMAL) 691—Equipment and AMAL 692—Consumables is to update rather than to streamline them, since T&R must maintain the biomedical equipment contained in other AMALs.

### **Approach**

Basic research methods were applied to the individual line items in AMALs 691 and 692 to determine the function of each item, whether it was current, or whether it was redundant. Manufacturers were contacted when necessary to provide additional information. Subject Matter Experts (SMEs) were recruited from T&R units at Medical Logistics Command, Camp Pendleton, CA; Regional Support Organization, San Diego, CA; Amphibious Group Three, San Diego, CA; Blount Island Command, Jacksonville, FL; and the Biomedical Equipment Technology School, Sheppard Air Force Base, TX. They served as consultants and were available for questions, opinions, and suggestions. Representatives of San Diego area commands met for three SME meetings, where progress was reviewed and recommendations were made.

### **Results**

Analysis of the T&R blocks resulted in recommendations for extensive changes to both AMAL 691 and 692. Unlike previous AMAL reviews, this one did not result in reductions in weight or cube; rather, equipment was updated in response to changes in other AMALs. The proposed changes represent an effort to bring the T&E blocks to a state of operational readiness.

### **Conclusions**

If the T&R blocks are to keep up with changes to the biomedical equipment carried in the SC, the process of updating them must incorporate several improvements. First, the nomenclature for AMALs 691 and 692 should include the end-item equipment National Stock Number so that T&R items are linked, whenever possible, to biomedical equipment items used in other functional areas. Second, Authorized Parts Lists (APLs) should be developed as soon as new biomedical equipment is introduced into other blocks to ensure that spare parts and calibration

tools are available when needed. Third, a database should be developed to link T&R items, APLs, and biomedical equipment electronically so that up-to-date information is readily available on desktop computers.

## **KEEPING THE FORWARD SURGICAL COMPANY IN TOP CONDITION: EVALUATION OF BIOMEDICAL EQUIPMENT TEST AND REPAIR AMALS**

The nature of the US Marine Corps mission is changing. The Operational Maneuver From The Sea (OMFTS) doctrinal concept describes the Marine Corps as a rapid reaction force with a sea-based operational station that allows rapid progress from ship to objective without the shore buildup that characterized previous operations.<sup>1</sup> The OMFTS concept emphasizes rapid tempo, momentum, and flexibility. It requires a medical support system that not only keeps pace with the speed and mobility of assault forces, but also keeps its state-of-the-art medical equipment in top running condition.

It is likely that Marine units will be widely dispersed and highly mobile, with casualties occurring in far-forward positions. Thus, medical support teams must be rapidly deployable and equipped with lighter, more flexible resources. The development of modular, efficient Authorized Medical Allowance Lists (AMALs) is important in achieving the goals of speed and mobility. Therefore, mission-specific standards of care and clinical requirements have been established so that only those items required to maintain the standards of care are transported. To accomplish this objective, the logistical footprint of the surgical company (SC) function has been reduced without compromising the quality of clinical care rendered by forward forces.<sup>2</sup>

Methodology developed by the Naval Health Research Center (NHRC), San Diego, California, models clinical factors for specific theaters of operation, then determines supplies needed for an identified clinical requirement. NHRC has completed its evaluation of all of the Marine Corps medical supply blocks that are directly involved with patient care, such as the battalion aid station (BAS), Shock Surgical Team/Triage (SST), acute care ward (Ward), and operating room (OR). Clinical support areas, namely, the laboratory, x-ray, and pharmacy facilities, also have been examined. Significant reductions in weight and cube have been achieved in all of these AMALs.<sup>2-6</sup> An evaluation of dental supplies and equipment in the Field Dental Operation block, based on the same methodology, is nearing completion.<sup>7</sup> This study examines the biomedical equipment test and repair (T&R) AMALs 691 and 692. The purpose of evaluating AMAL 691–Equipment and AMAL 692–Consumables is to update rather than to streamline them, since T&R must be capable of maintaining the biomedical equipment contained in other AMALs.

Headquarters, Marine Corps, Quantico, Virginia, Marine Corps Systems Command (MARCORSYSCOM), and the Joint Readiness Clinical Advisory Board, Fort Detrick, Maryland, have voiced support for the NHRC approach. Consequently, MARCORSYSCOM AMAL management and the Naval Medical Logistics Command, Fort Detrick, have worked to incorporate changes generated by the NHRC model into the

AMAL lists.<sup>2</sup> It is hoped that through continued cooperation substantial improvement in the AMALs can be achieved.

## **METHOD**

### **Overview of T&R**

The T&R AMALs differ from those of the SC clinical areas. The BAS, OR, SST, Ward, and Dental are directly involved with patient care, and the lab, x-ray, and pharmacy provide clinical support for these functional areas. T&R, however, is the technical component, with responsibility for keeping the medical equipment running properly; as such, it is the only functional area where AMALs are not directly determined by clinical requirements. Instead, the contents of the T&R AMALs must include the parts and tools needed to test, calibrate, and repair field medical equipment. The following review of the NHRC model will help to clarify the interaction between T&R and the other AMALs.

### **Overview of the NHRC Model**

The NHRC model for Echelons I and II was designed to interface with the Echelons III and IV Deployable Medical Systems (DEPMEDS) model,<sup>8</sup> which consists of relational databases called the Time, Task, Treater files. The DEPMEDS model was developed to standardize medical materiel and to assemble it into sets so that each of the services could configure medical facilities according to its own unique requirements. The data in the DEPMEDS model are based on treatment protocols for 319 patient conditions (PCs) that are identified by a number and include a short description. The numbers range from 1 to 350, with some blank numbers to allow for the addition of new PCs. The PCs represent groupings of closely related diagnoses that are considered to be representative of the injuries expected to occur in theater.<sup>9</sup> To build upon this existing standard, the structural characteristics of the Echelon I and II NHRC databases are compatible with those of the DEPMEDS Time, Task, Treater files.

The 319 DEPMEDS PCs form the core around which the NHRC Echelon I and II medical supply model was developed. The medical tasks required to treat each PC at Echelon IA—First Responder, Echelon IB—BAS, and Echelon II—Surgical Company were identified, and the tasks were linked to the appropriate supplies needed to carry them out. Finally, panels of subject matter experts (SMEs) validated these PC-Task-Supply relationships.

Consumable AMALs contain disposable items that are linked to medical tasks carried out in specified functional areas. The number of expected cases for each PC determines consumable requirements, therefore, it was necessary to project a casualty stream. The Army's Patient Generating Model (PATGEN),<sup>10</sup> a tool for projecting casualties, was used to determine a 60-day, worst-case operational scenario. Consumables sufficient to treat

the projected number of patients per PC for the length of their stay in a given functional area were calculated.

Equipment AMALs contain the equipment and reusable materiel needed to establish the functional area. To project equipment requirements, each item considered for inclusion in a given AMAL was linked to a known medical task that would be performed in that functional area. For example, items in AMAL 631, the SST equipment AMAL, were linked to tasks that are performed in the SST. Quantities sufficient to provide care to a given number of patients by a predetermined number of providers were calculated.

When new equipment is added or obsolete equipment is removed from an AMAL, the change is reported to T&R, where corresponding changes in T&R AMALs are implemented.

### **Approach**

The field of biomedical equipment technology is highly complex, and many of the items contained in AMALs 691 and 692 are very specialized. Therefore, the first task was enlisting SMEs experienced in T&R at the beginning of the project to serve as consultants. The SMEs represent the following commands:

- Medical Logistics Command, 1<sup>st</sup> Supply Bn, 1<sup>st</sup> FSSG, Camp Pendleton, CA
- Regional Support Organization, San Diego, CA
- Amphibious Group 3, San Diego, CA
- Biomedical Equipment Repair School, NSHS, Sheppard AFB, TX
- Blount Island Command, Jacksonville, FL

T&R is responsible for the condition of medical equipment from seven functional areas of the SC, plus Dental. They are:

- 618 – Laboratory
- 627 – X-Ray
- 629 – Pharmacy
- 631 – Shock Surgical Team/Triage
- 633 – Acute Care Ward
- 635 – Battalion Aid Station
- 639 – Operating Room
- 662 – Field Dental Operatory

Combined, these AMALs contain over 500 items. To make this list more manageable, the seven SC AMALs were merged and sorted by National Stock Number (NSN). Duplicates (those items carried in more than one AMAL) were eliminated. Equipment, such as bowls or scissors, that obviously would not be tested, calibrated, or repaired also were removed. Then SMEs examined the list of remaining equipment. They were instructed to

delete additional items that would not be tested, calibrated, or repaired by T&R, resulting in an abbreviated list of about 50 items of current biomedical equipment. The list, seen in Appendix A, served as a guideline for evaluating the contents of AMALs 691 and 692, because T&R must carry the equipment and supplies necessary to maintain this equipment during operations. ADAL 662 (Dental) was considered separately because it carries both consumables and equipment, and because it is currently being evaluated by dental specialists.

Other tasks included ensuring that the end-item NSNs given in the nomenclature of AMALs 691 and 692 matched NSNs of biomedical equipment currently carried in an SC AMAL equipment list or Authorized Dental Allowance List 662. If researchers needed to know more about a specific T&R item, for instance, what it is used for, whether it is still in production, and whether parts and accessories are available, the manufacturer was contacted to obtain the additional information. If the end-item was not known, attempts were made to identify it. Items intended for use with obsolete equipment were deleted. The SMEs' recommendations for additions to the T&R AMALs were researched to find the model that would best meet requirements. Based on these findings, a tentative schedule of changes for AMALs 691 and 692 listed proposed additions and deletions, as well as items to be retained without change.

The introductory SME meeting took place at NHRC, where researchers and four biomedical equipment technicians (BMETs) from San Diego area commands reviewed AMALs 691 and 692 as well as the current equipment list. At this time, T&R items known to be obsolete were deleted. Conversely, items were suggested for addition to the T&R AMALs, based on the experience and knowledge of the SMEs. For example, hydraulic fluid was marked for deletion from AMAL 692 because no current equipment requires it, but general-purpose bearing grease was added because it is needed to maintain several items of equipment. The SMEs also pointed out areas in need of clarification and further research before final recommendations could be made.

A second meeting took place at MEDLOG, Camp Pendleton. AMAL 692 was unpacked and the contents were visually inspected and compared with the proposed schedule of changes. Seeing and handling the consumable items prompted additional changes in the AMAL. For example, solder that was found to contain lead was deleted; also, hardware, such as screws, nuts, and bolts, were found to be packaged in numerous small cellophane bags, and the need for more organized storage was evident. The proposed changes to AMAL 691 were reviewed line by line at this time. Suggested changes and areas for further research were noted, and a second draft of the AMAL 691-692 schedule of changes incorporated these latest recommendations.

Researchers met for the third time with BMETs from MEDLOG, Camp Pendleton, to review the proposed changes to the T&R AMALs. The purpose of this meeting was to proofread the revised AMALs and to make any final additions, deletions, or revisions. Following this meeting, researchers and BMETs from all of the SME commands



communicated by telephone and e-mail to complete the schedule of changes that would form the basis for this report.

## RESULTS AND DISCUSSION

The recommended changes to AMALs 691 and 692, unlike those of previous AMAL analyses, did not focus on reducing the weight, cube, or cost of the blocks. For this analysis, emphasis was placed on replacing obsolete equipment, deleting parts for medical equipment that is no longer used, adding new parts and equipment to correspond with changes to the medical equipment blocks, and adding organizational items to make the T&R block more functional.

### AMAL 691-Equipment

AMAL 691 carries the tools and apparatus needed to perform testing, measurement, calibration, and diagnostics on biomedical equipment. It carries basic tools as well as highly specialized testing and calibration equipment. Most of the recommended changes to AMAL 691 were driven by two events. First, the North American Drager, Inc. *Narkomed M* anesthesia apparatus was added to the OR, necessitating the additions shown in Table 1. Second, a Field Supply and Maintenance Analysis Office review held at Camp Pendleton recommended acquiring testing equipment with memory and printing

**Table 1. Additions to AMAL 691 for Narkomed M Anesthesia Apparatus**

Nomenclature	Part	NSN	Price
Adapter Assm - Test Terminal	4104389	Pending	15.00
Baromed Pressure Test Fixture	4108137	Pending	29.00
Breathing Bag - 3 Liter	9995330	Pending	79.00
Breathing System Leak Test Device	S010159	Pending	150.00
Digital Pressure Manometer (Sensym 200 CD, Bio-Tek DPM2 or Equivalent)	N/A	Pending	537.00
Dow Corning High Vacuum Grease	4105908	Pending	74.00
Flowmeter Test Stand	S000081	Pending	685.00
Fresh Gas Leak Test Device	4113119	Pending	51.00
Fresh Gas O2 Adapter-Assembly	4110425	Pending	426.00
Fresh Gas Outlet Volume Test Device	S010158	Pending	25.00
Inspiration Valve Leak Test Device	4109292	Pending	Not avail.
Pressure Test Assembly W/Adapters	4114807	Pending	450.00
Regulator Test Pressure Gauge	S000063	Pending	362.00
Riken Carrying Case	N/A	Pending	65.00
Riken Gas Indicator Model 18	N/A	Pending	2250.00
Scavenger Adapter With Hose Barb	4108114	Pending	27.00
Stopwatch Hour Minute & Second Scale Crown Or Push Piece Control	N/A	6645011064302	5.98
Test Minute Volume Meter Or Equivalent	2212300	Pending	Not avail.
Spiromed Sensor Lubrication Kit	2218180	Pending	32.00

capability to reduce paperwork and error and to improve recordkeeping capabilities. The SMEs recommended an automated biomedical equipment test system, named *medTester 5000C*, from DNI Nevada, Inc. Two of its components, the *Impulse 4000 Defibrillator Analyzer* and the *Cufflink NIBP Simulator* are already under government contract. Although a new non-invasive blood pressure simulator is recommended, the battery-operated electrocardiogram blood pressure calibrator (NSN 6625012060268) has been retained because T&R may be called upon to calibrate equipment from medical units other than the Surgical Company. Table 2 shows the additions and deletions resulting from this recommendation. Some of the items in Tables 1 and 2 do not yet have NSNs, and some prices are unavailable. The proposed AMAL 691 is in Appendix B.

**Table 2. Upgrades to Medical Testing Equipment in AMAL 691**

Item	Model	NSN	Cost
<b>Items to Be Added</b>			
MedTester 5000C Base Model	9519-0248	Pending	\$2620
Impulse 4000 Defibrillator Analyzer	9519-0500	6515014491420	\$2681
Cufflink NIBP Simulator	9519-0502	6515014491423	\$3766
454A Electrosurgical Analyzer	9519-0188	Pending	\$3780
RS-232 Printer Port Module #02	9513-0242	Pending	\$ 495
Memory Module #03 - 100 Records	9513-0243	Pending	\$495
Expanded Memory Module #04	9513-0244	Pending	\$495
Waveform & Extended Test Module #05	9513-0245	Pending	\$495
Defib Autosequences Testing Module #08	9513-0248	Pending	\$495
ESU Autosequences Testing Module #11	9513-0251	Pending	\$495
NIBP Autosequences Testing Module #14	9513-0254	Pending	\$495
Interface Cable To PC/454A/Cufflink	3010-0250	Pending	\$79
Interface Cable to Impulse 4000	3010-0467	Pending	\$79
<b>Items to Be Replaced</b>			
Tester Defibrillator Energy	970066	6625004339063	\$578
Tester Safety Electrical	2000A	6625012065999	\$2141

Further recommendations for changes to AMAL 691 include the addition of seven items and the deletion or replacement of three others. These items and the reasons for the suggested change are listed in Table 3.

**Table 3. Other Proposed Changes to AMAL 691**

Item	NSN	Cost	Reason
<b>Items to Be Added</b>			
Digital Logic Probe, Global Specialties Model LTC-5	Pending	Not Avail.	Efficiency
Electric Heater Gun	4940010287493	\$70	For Shrink Wrap
Portable Flood Lamp w/ Recharger	6230013250595	\$94	Needed in Field
Non-Metallic Crescent Wrench	Pending	Not Avail.	Specialized Repairs

**Table 3. Other Proposed Changes to AMAL 691 (continued)**

Item	NSN	Cost	Reason
Oscilloscope, 100 Mhz Dual Channel	6625014253856	\$2545	Old Model Obsolete
Power Supply, Variable	6130014613510	Not Avail.	Efficiency
Soldering/Desoldering Station	3439013322340	\$677	Safety, Efficiency
<i>Items to be Deleted/Replaced</i>			
Oscilloscope	6625011223501	\$3973	Can't Get Parts, Probe
Pneumatic Tire Inflator Gauge	4910003197506	\$19	Not Needed
Simpson Analog Multimeter	6625012692463	\$210	Not Needed

### **AMAL 692-Consumables**

AMAL 692 contains parts and supplies that are used and replenished. In examining this AMAL, it quickly became apparent that many of the items either corresponded to obsolete end items, or were obsolete themselves. These items, shown in Table 4, were removed from the AMAL. Another factor in recommending changes to this AMAL concerned disorganization of the supplies due to the presence of numerous small individual packages, particularly of small hardware items, such as nuts, bolts, and screws. To rectify this situation, compartmented drawers were added to provide organized storage for small items, thus avoiding the time and expense of replacing hundreds of line items. When possible, kits replaced loose items. These recommendations are shown in Table 5. Items such as tape were overstocked, and quantities of these supplies were reduced, as shown in Table 6. The complete proposed AMAL 692 is in Appendix C.

**Table 4. Obsolete Items Deleted From AMAL 692**

Nomenclature	NSN	Qty	Cost	Reason
Ball Valve Ported E.I. 6515011858446 Gas Anesthesia Apparatus	4820013122955	1	\$2	Obsolete End Item
Cam Control Used On Fibrometer Model 60415	3040013153713	4	\$352	Obsolete End Item
Clip L.M Holder	652500L006133	24	\$24	Unknown
Connector Body	5935010144826	10	\$44	Obsolete
Connector Body	5935010241902	10	\$19	Obsolete
Connector Body	5935010901561	10	\$18	Obsolete
Connector Body	5935011469071	10	\$20	Obsolete
Connector Tubing Branched E.I. 6515-01-185-8446 Gas Anes App	6515013122958	1	\$33	Obsolete End Item
Diaphragm Gas Anesthesia End Item NSN 6515-01-185-	6515013126241	2	\$13	Obsolete End Item
Disk Valve End Item 6515011858446 Gas Anesthesia Apparatus	4820013122971	1	\$27	Obsolete End Item
Disk Valve End Item 6515011858446 Gas Anesthesia Apparatus	4820013122972	2	\$20	Obsolete End Item
Handcrank Assy Table	6530014156016	1	\$100	Unknown
Hydraulic Fluid	9150011313324	2	\$26	Obsolete
Lamp Fluorescent End Item Titration Apparatus	6240013139608	2	\$48	Obsolete End Item
Lamp Fluorescent End Item Titration Apparatus Laboratory	6240013139609	2	\$20	Obsolete End Item
Lampholder End Item Light Fantastic II (Appears To Be Obsolete)	6250013236515	4	\$69	Obsolete End Item
O-Ring .750" H .031" Cross Sect E.I. 6515010034133 Anes App	5330012481008	4	\$9	Obsolete End Item
Printed Circuit Board E.I. 6640012571944 Centrifuge Laboratory	5999013125141	2	\$1043	Obsolete End Item
Shield Safety Meter Flow Rate Indicating E.I. NSN 6515011858446	6680013122956	1	\$68	Obsolete End Item

**Table 4. Obsolete Items Deleted From AMAL 692 (continued)**

Nomenclature	NSN	Qty	Cost	Reason
Silicone Compound Silicone W/Corrosion Inhibitor Tube 8 Ounces	6850008807616	6	\$20	Obsolete
Solder Tin Alloy ()	3439002476931	3	\$53	Contains Lead
Solenoid Electrical End Item Fibrometer Model 60415	5945013134813	2	\$228	Obsolete End Item
Tube Bent Gas Anesthesia App End Item NSN 6515-01-185-8446	6515013126242	1	\$11	Obsolete End Item
Tube Support Telescoping Assy Light Surg E.I. NSN	6530013254356	1	\$1029	Obsolete End Item
Wrench Automatic Jet Hypodermic Injection App. Crest-Shape	6515007539610	2	\$110	Obsolete End Item

**Table 5. Items Proposed for Addition or Increased Quantities to AMAL 692**

Nomenclature	NSN	Qty	Cost	Reason
<b>Items to Be Added</b>				
12-Compartment Drawer (Kar Products Part No. 99034)	Pending	4	\$51	Organization
24-Compartment Drawer (Kar Products Part No. 99008)	Pending	12	\$153	Organization
4-Drawer Roller Rack (Kar Products, Part No. 99114)	Pending	4	\$208	Organization
Gear Box Assy	653000L006138	1	Not avail.	New Part
Grease Gp Bearing Grease	Pending	1	Not avail.	Basic Supply
Hand Crank Assembly Or Table	653000L006142	1	Not avail.	New Part
O2 Sensor/Monitor	Pending	4	\$704	Narkomed M
Sleeving Set	5970010245141	1	\$55	Organization
Tube, Corrugated, 22mmx12in Long (E.I. Anesth App)	Pending	1	\$32	Narkomed M
Replacement Bulb For Xray Viewer	6240001517628	2	Not avail.	Dental
<b>Items to Be Increased</b>				
Motor, Amalgamator	593000I006131	2	\$58	Dental
Detector Moisture Content E.I. NSN 6520001391246	6635013236641	12	\$11	Dental
<b>Items to Be Replaced</b>				
Insulation Sleeving Electrical	5970008122969	6	\$1	Replace with kit
Insulation Sleeving Electrical	5970008151295	6	\$1	Replace with kit
Insulation Sleeving Electrical	5970008428971	6	\$1	Replace with kit
Insulation Sleeving Electrical	5970009143118	6	\$1	Replace with kit

**Table 6. Recommended Reductions to Overstocked Items in AMAL 692**

Reduction	NSN	Nomenclature	Cost
Reduce From 12 To 6	5640001032254	Tape Duct Plas Coated Cloth Vapor Proof Alum Or Silver 2" X 60yd	\$14
Reduce From 12 To 6	5970004193164	Tape Insulation Electric	\$9
Reduce From 3 To 1	3439002559935	Flux Soldering Paste 1lb Can	\$5
Reduce from 20 to 10	4330013000535	Bowl Sediment U/O 6520012724531 Dental Operating&Treatment Unit (Dental)	\$180

### Discussion

The examination of AMALs 691 and 692 revealed some flaws in the process of keeping them current. However, these lapses can be corrected with a few basic steps. First, and

easiest, the AMAL list itself must include the NSNs of the end items in the nomenclature. One of the most difficult phases of this analysis was identifying the purpose of the parts, or connecting them to biomedical equipment. Including this information in the T&R nomenclature from the beginning would solve the problem. Second, the Authorized Parts List (APL) is an important tool used by the Fleet in its AMALs. Development of APLs for the Fleet Marine Force when new biomedical equipment is added to the SC, while initially labor-intensive, would prove valuable in the long run. Third, relational databases, such as Microsoft Access™, could be used to link the AMAL lists to APLs, so that the required parts could be called up simply by selecting either an end item or a T&R item on the computer screen.

The recommendation of adding organizational storage units to AMAL 692 is an example of a way to make the block more user-friendly. Another suggestion that arose during the course of SME meetings was to separate the dental items in T&R so that they are easily accessible. Dental is often deployed at some distance from T&R, or for some reason one or the other is not deployed. Therefore, having the dental items in a separate container would eliminate the need for duplication in Dental and T&R. The items proposed for this “dental can” have been designated by asterisks in Appendices B (AMAL 691–Equipment) and C (AMAL 692–Consumables).

The changes that have been proposed for the T&R AMALs are extensive. However, all recommendations have been made with the goal of achieving and maintaining operational readiness. As the SC improves its clinical capabilities, T&R must keep pace. This can only be accomplished by stocking AMALs 691 and 692 with the state-of-the-art equipment that is necessary to keep the SC in top condition to provide the best patient care during operations.

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## **APPENDIX A**

### **List of Current Biomedical Equipment in the Surgical Company**

**Appendix A**  
**List of Current Biomedical Equipment in the Surgical Company**

NSN	Nomenclature	618 Lab	627 X-ray	629 Pharm	631 SST	633 Ward	635 BAS	639 OR
6630014151593	Analyzer Blood Pribl Piccolo Point Of Care Whole Blood	x						
6630011479532	Analyzer Carbon Dioxide Hand Operated 304.8 ml Lg 101.6 mmW	x						
6630012346794	Analyzer Centrifugal Hematology 120/220v 50/60hz 216mm Id	x						
6630012776342	Analyzer Clinical Chemistry Kodak Ektachem DT60 Chem Analyzer	x						
6630012769462	Analyzer Module Clin Chemistry Elec Kodak Ektachem DTE Module	x						
6515011858446	Anes App Gas: W/O2 Monitor N2O O2 & Volatile Liq 4 Cy Cap Port							x
6515005842926	Balance Auto Shutoff Bld Collecting-Dispensing Bag 450ml Cap	x						
6515013724470	Blood & Fluid Warmer 110 Volt 50/60hz Ac 8.3x7x9.5"					x		x
6640012831435	Centrifuge Laboratory 11500 Rpm Electric Dc 9v 8.2x3.4x2.3"	x						
6640009309034	Centrifuge Laboratory 15ml Tu 115v 650/60 Hz 12x13.5in 135 Watts	x						
6525013456090	Chamber X-Ray Film Processing Darkroom Portable		x					
6640004188010	Counter Blood Cells Differential Rest Device Key Quantity 8	x						
6515014593834	Defibrillator External				x	x		x
4610009762420	Demineralizer Water Ion Exchange 115v 60hz Ac 10watts Bench Type	x						
6515000000069	Electrosurgical Apparatus Mobile 115v 50/60hz Or 220v 50hz Ac:							x
6515014553888	Headlamp Medical-Su				x	x	x	x
6525011608381	Illuminator Xray Film Fluorescent Illuminated 115v50/60hz Ac					x		x
6640012870642	Incubator Dry Heat 25-115 Deg C Ac 115/120v 50/60hz 38x10cm	x						
6515011841235	Light Head Fiber Optic Adj Spot Coaxial Headlight 5mm Sheath							x
6530013168733	Light Surgical Field: 110 Volt Ac Or 24 Volt Dc				x			x
6650012070829	Microscope Optical Binocular Histopathological & Pathological	x						
6515012796450	Monitor Oxygen Battery Powered 6.75x3.50" Audible/Visual Alarm							x
6515013156196	Monitor Patient Vital Signs 120/220v 60hz 8x5x4" Battery/Cord					x		x
6515014466766	Oximeter Pulse Portable Hand-Held 110/220v AC 50/60hz				x			



**Appendix A**  
**List of Current Biomedical Equipment in the Surgical Company**

NSN	Nomenclature	618 Lab	627 X-ray	629 Pharm	631 SST	633 Ward	635 BAS	639 OR
6515012485984	Oximeter Pulse: 120/230v 50/60hz AC Or Battery Operated							x
6525013862603	Processing Machine Rad Film Table Top: Compact120/230v50/60hz AC		x					
4110001156027	Refrigerator Mechanical Biologicals 4.5 Cubic Feet 115v 50/60hz	x		x				x
4110013889220	Refrigerator Solid State Bio:	x						
6530014572239	Regulator Oxygen				x	x	x	
6680011746276	Regulator Pressure Medical Gas Administration Appar Oxygen Sgl					x		x
6640011721132	Rotator Lab Variable Speed 12 X 13 X 6 In 120/230 V 50/60 Hz Ac	x						
6530014319005	Sink Unit Surgical Scrub And Utensil Hospital Field: 110v 60c Ac	x			x	x		x
6515010394884	Sphygmomanometer Aneroid 300mm Max Calibration W/Clip For Cuff				x	x	x	x
6530009262151	Sterilizer Surgical Dressing: Pressure Fuel Htd Crs 16x36 In							x
6515012080576	Stimulator Peripheral Nerve 1x1.50x5.25" Prtble Btry Pwr W/Case							x
6515014350050	Suction Apparatus Surg Programmable Battery 11-30v Or Ac Prtble				x	x	x	x
6530007098175	Table Operating Room Field:							x
6515011929456	Ultrasonic Unit Blood Flow Detection 120/230v 50/60hz Doppler				x			
6515012899820	Vaporizer Anesthesia Drawover:							x
6515011167903	Ventilator Mobile Volume:							x
6530014551653	Ventilator Volume Ptbl 8.870x11.5in Uni-Vent 120/220v Ac					x		
6525012005800	X-Ray Apparatus: Low Capacity Port		x					*

\*The Narkomed M anesthesia apparatus, NSN 6515-01-1840, has replaced this apparatus.

**APPENDIX B**  
**Test and Repair AMAL 691 - Equipment**

**Appendix B**  
**Test and Repair AMAL 691 - Equipment**

NSN	Nomenclature	Qty	UI	PRICE	UW	UC
3413001654136	Drilling Machine Upright: Bench 1/3 Hp 115v 60c 1 Ph 1/2 In Cap	1	EA	582.76	195.00	17.00
3439001321331	Desoldering Tool	3	EA	6.06	0.10	0.01
3439005420531	Soldering Torch Kit	2	EA	17.78	0.10	0.00
3439006186623	Soldering Gun Electric	3	EA	26.57	0.10	0.00
3439013322340	Soldering/Desoldering Station	1	EA	676.58	8.1	1.91
3460002211104	Vise Bench And Machine Table	2	EA	50.45	8.00	0.11
4240000523776	Goggles Industrial Plastic Clear Lens	3	PR	1.84	0.31	0.05
4240005422048	Faceshield Industrial Clear Visor	3	EA	8.37	0.25	0.50
4940010287493	Heater, Gun Type, Electric	1	EA	70.29	0.55	0.01
5110002042685	File Set Hand	2	SE	24.07	1.50	0.01
5110002684224	Stripper, Wire, Hand	3	EA	11.02	0.75	0.02
5110002730128	Shears Metal Cutting Hand 9"Lg	2	EA	6.41	1.00	0.02
5110002899657	Frame Hand Hacksaw Adjusts For 10-12 In Blades	3	EA	3.77	0.10	0.00
5110003575593	Chisel Set Cold Hand	3	SE	11.60	7.00	0.15
5110005958316	File Set Hand	3	SE	36.87	7.00	0.00
5120000618543	Hammer Hand	1	EA	9.72	0.10	0.00
5120000812307	Wrench Set Socket: Sq Drive 1/2 In Drive 12 Pt 3/8 To 1 1/4 In	1	SE	86.50	0.10	0.00
5120001129599	Key Set Socket Head	3	SE	2.03	0.10	0.00
5120001487917	Wrench Set Combination Box And Open End Sizes	3	SE	75.69	5.00	0.05
5120001768964	Vise Printed Circuit Board Sliding Bar Type Rubber Jaws	2	EA	83.51	5.00	0.25
5120001800681	Vise Machinists: Swivel Base Stationary Jaw Optl Jaw Width/Open	1	EA	67.51	32.00	0.50
5120002036431	Clamp,C - 6"	4	EA	17.37	10.00	0.25
5120002036439	Clamp,C - 2.5"	4	EA	3.51	0.10	0.01
5120002249453	Puller Fuse	3	EA	1.65	0.25	0.10
5120002420762	BA Wrecking Crow Ag13 Gooseneck 36" L Any Acceptable Width	2	EA	4.86	7.00	0.39
5120002643795	Wrench Open End 6 Inch	3	EA	6.87	0.10	0.00
5120002643796	Wrench Adjustable Steel/Chromium 12in Overall Length	2	EA	11.63	1.58	0.03
5120002771483	Wrench Pipe Adjustable Heavy Duty 6 In Lg 1/2 In Capacity	3	EA	8.48	2.60	0.05
5120002771485	Wrench Pipe Adjustable Heavy Duty 10" .250 To 1.0" Capacity	3	EA	11.25	0.10	0.00
5120002780325	Screw Starter, Hand	3	EA	2.33	0.25	0.05
5120002780327	Screw Starter, Hand	3	EA	2.78	0.60	0.06
5120002930019	Bender Set Tube Hand	1	SE	5.90	5.00	0.75

**Appendix B**  
**Test and Repair AMAL 691 - Equipment**

NSN	Nomenclature	Qty	UI	PRICE	UW	UC
5120002933399	Mallet Rubber	1	EA	7.75	38.40	3.00
5120003226231	Wrench Set Socket Mechanic Chrome Plated 3/8 In Square Drive	3	SE	105.59	4.00	0.11
5120004941911	Wrench Plier Curved Jaw With Cutter 8 1/2 In Lg	3	EA	7.72	1.20	0.01
5120005373375	Pliers Slip Joint 7.625" Lg	3	EA	7.43	0.80	0.06
5120005959305	Puller Mechanical	1	EA	34.46	0.10	0.04
5120006795655	Calking Gun 8.5" Cartridge Length 2" Diameter	1	EA	4.16	2.40	0.48
5120007561156	Pliers Hand	3	EA	9.79	10.50	0.03
5120008506313	Retrieving Tool	3	EA	3.25	5.60	0.10
5120008833003	Punch Set, Drive Pin	3	SE	9.65	1.00	0.03
5120008891796	Tacker Staple Gun Accommodates Strips Of 84 Flattop Staples	1	EA	15.55	2.00	0.10
5120009006113	Hammer, Hand	3	EA	9.79	1.00	0.10
5120009282036	Pliers	3	EA	33.69	0.25	0.25
5120009354641	Key Set Socket Head	2	SE	11.92	72.00	9.22
5120009357315	Wrench Set Socket	1	SE	111.30	8.00	0.20
5120009498368	Alignment Set	1	SE	20.06	0.10	0.00
5120009650604	Wrench Plier W/O Attachments	3	EA	7.11	0.10	0.00
5120010464979	Wrench Set Combination Box And Open End 14s	1	SE	164.69	3.00	0.25
5120012894310	Riveter Blind Hand Stra Rivet Sz Stdndr 114 Sz Nos 42,44,54,&64	3	EA	22.98	0.10	0.00
5130002931849	Drill Electric Portable: 1/2 In Nom Size Hdy St Drive	1	EA	112.29	5.00	0.28
5130005968404	Etcher, Electric	1	EA	17.84	0.50	0.25
5130009357354	Drill Electric Portable Voltage Rating 120 Volts 60 Hz	1	EA	68.17	0.10	0.00
5130010146856	Rotary Tool Kit Elec 30 Components Case Manual Accessory List	1	EA	49.60	45.00	1.42
5133002930983	Drill Set Twist: Hss St Rd Shank RH Cut W/Case	3	SE	30.40	0.10	0.00
5140003195079	Tool Box Portable	3	EA	81.66	31.00	1.60
5180005961038	Cutter And Flaring Tool Kit	1	KT	63.38	4.00	0.40
5180008563471	Threading Set Screw Adjustable Die Stock And Handle Tap Wrench	1	KT	61.71	0.00	0.00
5180010464980	Tool Kit, Electronic	3	KT	315.32	30.00	2.00
5210002037763	Gage Screw Pitch Encased Blade	1	EA	18.27	0.10	0.01
5210002211991	Gage Screw Pitch	1	EA	16.46	0.80	0.02
5210002933505	Tape Measuring 10 Feet	3	EA	3.74	3.00	0.06
5440000618900	Stepladder Fiberglass 6ft	1	EA	88.50	41.00	0.60
5975011624448	Outlet Box 6 Place 120 Volt 50/60 Hz Ac	3	EA	362.21	5.50	0.18

**Appendix B**  
**Test and Repair AMAL 691 - Equipment**

NSN	Nomenclature	Qty	UI	PRICE	UW	UC
6130014613510	Power Supply, Variable	1	EA	Not Avail.	Not Avail.	Not Avail.
6150001440091	Cable Assembly Power	6	EA	9.82	2.40	0.13
6230011760191	Flashlight	3	EA	2.93	0.55	0.12
6230013250595	Lantern Battery Operated Rechargeable With 110V Recharger	1	EA	93.86	0.01	0.85
6515014491420	Analyzer Defibrillator EKG Transcutaneous Pacemaker Battery Operated	1	EA	2681.32	8.50	0.21
6515014491423	Analyzer Non-Invasive Blood Pressure Adult/Infant/Neonatal	1	EA	3766.14	10.00	1.00
6520012422375	Compressor - Dehydrator Dental Equipment:	1	EA	3268.85	160.00	10.00
6530012943297	Cart Anesthesia 109lb 18x26x35"Enamel Red 5 Pull-Out Gray Drawers	1	EA	186.77	20.00	1.02
6625005392009	Lead, Test	3	EA	2.18	0.01	0.01
6625010428213	Test Set Electrosurgical Apparatus: 115/230v 50-60hz 700watts	1	EA	2060.00	15.00	0.55
6625010634303	Voltmeter Digital	1	EA	850.00	8.00	0.75
6625010656949	Lead, Test	3	EA	2.56	0.01	0.01
6625011011766	Lead Set, Test	3	EA	7.95	0.10	0.01
6625012060268	Calibrator ECG-BP Battery Operated	1	EA	598.80	5.50	0.75
6625012139354	Multimeter (Fluke 77)	3	EA	69.00	0.50	0.10
6625013120894	Cal & Verification Sys: Pribl Bttry Oper Dgnstc X-Ray Sys O/P	1	EA	2460.68	5.00	0.90
6625014253856	Oscilloscope 100 MHz Dual Channel	1	EA	2545.00	Not Avail.	Not Avail.
6640012078234	Tachometer Photoelectric Solid State 5-1/8"W X 7-1/2"H X 2-1/2"D	1	EA	453.47	20.00	4.00
6645011064302	Stopwatch Hour Minute & Second Scale Crown Or Push Piece Control	1	EA	5.98	0.10	0.01
7105007100210	Table Folding Legs: Laboratory	3	EA	273.59	30.00	1.25
7920002915815	Brush Wire Scratch D7 Curved Handle	3	EA	1.66	0.47	0.02
NSN Pending	454A Electrosurgical Analyzer	1	EA	3780.00	Not Avail.	Not Avail.
NSN Pending	Adapter Assm - Test Terminal	1	EA	15.00	Not Avail.	Not Avail.
NSN Pending	Baromed Pressure Test Fixture (E.I. Anesth App)	1	EA	29.00	Not Avail.	Not Avail.
NSN Pending	Breathing Bag - 3 Liter	1	EA	79.00	Not Avail.	Not Avail.
NSN Pending	Breathing System Leak Test Device (E.I. Anesth App)	1	EA	150.00	Not Avail.	Not Avail.
NSN Pending	Cufflink NIPB Simulator	1	EA	4465.00	Not Avail.	Not Avail.
NSN Pending	Digital Logic Probe (Global Specialties Model LTC-5)	1	EA	Not Avail.	Not Avail.	Not Avail.
NSN Pending	Digital Pressure Manometer (Sensym 200 CD, Bio-Tek DPM2 Or Equiv.)	1	EA	537.00	Not Avail.	Not Avail.
NSN Pending	Dow Corning High Vacuum Grease (E.I. Anesth App)	1	EA	74.00	Not Avail.	Not Avail.
NSN Pending	Flowmeter Test Stand (E.I. Anesth App)	1	EA	685.00	Not Avail.	Not Avail.
NSN Pending	Fresh Gas Leak Test Device (E.I. Anesth App)	1	EA	51.00	Not Avail.	Not Avail.

**Appendix B**  
**Test and Repair AMAL 691 - Equipment**

NSN	Nomenclature	Qty	UI	PRICE	UW	UC
NSN Pending	Fresh Gas O2 Adapter-Asm (E.I. Anesth App)	1	EA	426.00	Not Avail.	Not Avail.
NSN Pending	Fresh Gas Outlet Volume Test Device (E.I. Anesth App)	1	EA	25.00	Not Avail.	Not Avail.
NSN Pending	Inspiration Valve Leak Test Device (E.I. Anesth App)	1	EA	Not Avail.	Not Avail.	Not Avail.
NSN Pending	Interface Cable: Medtester 5000c To PC/454A/Cufflink	1	EA	79.00	Not Avail.	Not Avail.
NSN Pending	Medtester 5000C Defib Autosequences Testing Mod #08	1	EA	495.00	Not Avail.	Not Avail.
NSN Pending	Medtester 5000C Esu Autosequences Testing Module #11	1	EA	495.00	Not Avail.	Not Avail.
NSN Pending	Medtester 5000C Memory Module - 100 Records )03	1	EA	495.00	Not Avail.	Not Avail.
NSN Pending	Medtester 5000C Memory Module - Expanded #04	1	EA	495.00	Not Avail.	Not Avail.
NSN Pending	Medtester 5000C NIPB Autosequences Testing Module #14	1	EA	495.00	Not Avail.	Not Avail.
NSN Pending	Medtester 5000C RS-232 Printer Port Module #02	1	EA	495.00	Not Avail.	Not Avail.
NSN Pending	Medtester 5000C Waveform And Extended Test Module #05	1	EA	495.00	Not Avail.	Not Avail.
NSN Pending	Non-Metallic Crescent Wrench	1	EA	Not Avail.	Not Avail.	Not Avail.
NSN Pending	Pressure Test Assembly W/Adapters (E.I. Anesth App)	1	EA	450.00	Not Avail.	Not Avail.
NSN Pending	Regulator Test Pressure Gauge (E.I. Anesth App)	1	EA	362.00	Not Avail.	Not Avail.
NSN Pending	Riken Carrying Case	1	EA	65.00	Not Avail.	Not Avail.
NSN Pending	Riken Gas Indicator Model 18	1	EA	2250.00	Not Avail.	Not Avail.
NSN Pending	Scavenger Adapter With Hose Barb (E.I. Anesth App)	1	EA	27.00	Not Avail.	Not Avail.
NSN Pending	Spiromed Sensor Lubrication Kit (E.I. Anesth App)	1	EA	32.00	Not Avail.	Not Avail.
NSN Pending	Test Minute Volume Meter Or Equiv. (E.I. Anesth App)	1	EA	Not Avail.	Not Avail.	Not Avail.
NSN Pending	Tester Safety Electrical Medical Equipment Solid State Digital	1	EA	2620.00	Not Avail.	Not Avail.

## **APPENDIX C**

### **Test and Repair AMAL 692 – Consumables**

**Appendix C**  
**Test and Repair AMAL 692 - Consumables**

NSN	Nomenclature	Qty	UI	Price	UW	UC
01051F2067015	Medical/Dental Equip Maint Record	10	HD	1.90	0.25	0.01
3020014156017	Gearbox Assembly Table	1	EA	100.00	1.5	0.40
3110013517512	Bearing,Roller,Cyli	2	EA	8.44	0.1	0.10
3439004386293	Solder, Tin Alloy, .01"	3	SL	15.71	1	0.02
3439010087580	Solder Tin Alloy 0.015" Diameter 1/2lb Spool	6	SL	3.72	0.5	0.01
4140011866449	Fan, Tube Axial	2	EA	54.10	0.03	0.03
4140012624492	Impeller Fan Axial E.I. 4110001156027 Refrigerator Biological	2	EA	29.75	0.35	0.01
4820013140753	Regulator Thermostatic Temperature End Item 6665006824765	1	EA	198.15	0.88	0.01
5110002774590	Blade Hand Hacksaw Steel Blade 18 Teeth Per Inch 12 In Lg 10s	1	BD	5.14	5	0.08
5305000685407	Screw, Cap, Socket Head, 1-1/2"	100	EA	0.13	0.1	0.10
5305000685414	Screw, Cap, Socket Head, 1/2"	1	HD	3.25	0.1	0.10
5305000685415	Screw, Cap, Socket Head, 3/4"	1	HD	4.75	0.1	0.10
5305002257774	Screw, Cap, Socket Head, 1"	100	EA	0.27	0.1	0.10
5305006397715	Setscrew	100	EA	0.22	0.01	0.01
5305007176948	Setscrew, D5 Hexagon, Thread Class 3a	1	HD	7.33	0.01	0.01
5305007195339	Setscrew	1	HD	1.46	0.01	0.01
5305007195346	Screw, Set, No 8-32	1	HD	4.00	0.01	0.01
5305007239387	Setscrew	1	HD	2.21	0.01	0.01
5305007239398	Setscrew	100	EA	0.21	0.01	0.01
5305007245813	Setscrew	1	HD	8.34	0.01	0.01
5305007246798	Setscrew	100	EA	0.03	0.01	0.01
5305009887605	Screw, Cap, Socket Head, 7/8"	1	HD	7.74	0.1	0.10
5305009887609	Screw, Cap, Socket Head, 3/4"	100	EA	0.13	0.1	0.10
5305009887835	Screw, Cap, Socket Head, 1-1/2"	100	EA	0.50	0.1	0.10
5310000636716	Nut,Plain,Wing	1	HD	13.69	0.01	0.01
5310000808495	Nut,Plain,Wing	1	HD	4.66	0.01	0.01
5310001670721	Washer,Lock	1	HD	0.64	0.01	0.01
5310001670801	Washer,Flat	1	HD	1.67	0.01	0.01
5310001670803	Washer,Flat	1	HD	2.21	0.01	0.01
5310001670804	Washer Flat Crs	1	HD	2.35	0.1	0.00
5310001670805	Washer Flat Crs 0.443 In Diameter	1	HD	8.65	0.01	0.01
5310001937577	Washer,Lock	1	HD	0.42	0.01	0.01



Appendix C  
Test and Repair AMAL 692 - Consumables

NSN	Nomenclature	Qty	UI	Price	UW	UC
5310002240747	Washer, Lock	1	HD	0.58	0.01	0.01
5310004005503	Nut, Plain, Hexagon	1	HD	3.68	0.01	0.01
5310005319515	Washer Flat	1	HD	2.32	0.01	0.01
5310005501130	Washer, Lock	1	HD	0.53	0.01	0.01
5310005590070	Washer, Lock	1	HD	0.48	0.01	0.01
5310005765752	Washer, Lock	1	HD	0.41	0.01	0.01
5310005790079	Washer, Lock	1	HD	0.37	0.01	0.01
5310005795554	Washer, Lock	1	HD	0.33	0.01	0.01
5310005957237	Washer, Lock	1	HD	1.09	0.01	0.01
5310007207798	Nut, Plain, Wing, .6"Wd, .3"Hi, .3"Dia, Unc	1	HD	2.80	0.01	0.01
5310007208549	Nut, Plain, Wing	1	HD	5.09	0.01	0.01
5310008551102	Nut, Plain, Hexagon	1	HD	3.49	0.01	0.01
5310009282690	Washer Lock Steel Comp 302 Overall Passivate Overall	1	HD	0.33	0.01	0.01
5310009296395	Washer, Lock	1	HD	1.11	0.01	0.01
5310009338118	Washer, Lock	1	HD	0.64	0.01	0.01
5310009338119	Washer, Lock	1	HD	0.41	0.01	0.01
5310009338120	Washer, Lock	1	HD	0.70	0.01	0.01
5310009338121	Washer, Lock	1	HD	1.64	0.01	0.01
5310009349746	Nut, Plain, Hexagon	1	HD	0.64	0.01	0.01
5310009349762	Nut, Plain, Hexagon	1	HD	2.27	0.01	0.01
5310009349763	Nut, Plain, Hexagon	1	HD	1.03	0.01	0.01
5310009349764	Nut, Plain, Hexagon	1	HD	3.08	0.01	0.01
5310009746623	Washer, Lock	1	HD	2.80	0.01	0.01
5310009847042	Washer, Lock	1	HD	3.41	0.01	0.01
5310010679589	Washer, Lock	100	EA	0.01	0.01	0.01
5315005985916	Cotter Pin Assortme	1	AT	1.04	5	0.18
5325002056552	Ring, Retaining	100	EA	0.04	0.01	0.01
5325002868718	Ring, Retaining	100	EA	0.09	0.01	0.01
5325005433981	Ring, Retaining	1	HD	2.56	0.01	0.01
5325005981138	Ring, Retaining	100	EA	0.07	0.01	0.01
5325005981840	Ring, Retaining	100	EA	0.06	0.01	0.01
5325007250969	Ring, Retaining	100	EA	0.04	0.01	0.01

**Appendix C**  
**Test and Repair AMAL 692 - Consumables**

NSN	Nomenclature	Qty	UI	Price	UW	UC
5325008164238	Ring,Retaining	100	EA	0.52	0.01	0.01
5325008171327	Ring,Retaining	100	EA	0.07	0.01	0.01
5325008273262	Ring Retaining Passivated .238 Inch Inside Dia	100	EA	0.19	0.001	0.00
5325008781908	Ring,Retaining	100	EA	0.09	0.01	0.01
5350002293092	Cloth,Abrasive	1	RO	22.32	1	0.10
5350002293095	Cloth,Abrasive	1	RO	22.02	1	0.10
5365002635907	Ring, Retaining, Ext., .426 ID	100	EA	0.93	0.01	0.00
5365002635915	Ring, Retaining, Ext., .279 ID	100	EA	0.25	0.01	0.00
5365002827120	Ring, Retaining, Ext., .37 ID	100	EA	0.40	0.01	0.00
5365002986564	Ring, Retaining, Ext., .224 ID	1	PG	5.31	0.1	0.10
5365006873379	Ring, Retaining, Int., .697 ID	3	HD	2.13	0.25	0.01
5365007541082	Ring, Retaining, Int., .831 ID	300	EA	0.04	0.001	0.00
5365008047645	Ring, Retaining, Ext., .461 ID	100	EA	0.57	0.001	0.00
5365008049735	Ring, Retaining, Int., .415 ID	3	HD	2.11	0.1	0.10
5365008049743	Ring, Retaining, Int., .548 ID	300	EA	0.13	0.001	0.00
5365008077968	Ring, Retaining, Int., .763 ID	300	EA	0.04	0.001	0.00
5365009231326	Ring, Retaining, Ext., .181 ID	100	EA	0.21	0.01	0.00
5365012352700	Bushing Machine Thread Plastic 1/2-20 Thrd Sz .590" Overall L	10	EA	4.22	0.35	0.01
5905013236486	Resistor Fixed Composition End Item Electrosurgical Apparatus	2	EA	1.68	0.15	0.01
5920000106652	Fuse Cartridge	20	EA	0.08	0.1	0.00
5920000117142	Fuse Cartridge 125v Ac/Dc 10 Amps Nonrenewable Fusible Element	20	EA	0.08	0.1	0.00
5920000432641	Fuse Cartridge	20	EA	0.19	0.1	0.00
5920000504953	Fuse Cartridge 2a Tube Type Style	20	EA	0.08	0.1	0.00
5920001319896	Fuse Cartridge	20	EA	0.77	0.1	0.00
5920001999498	Fuse Cartridge 2a Tube Type	20	EA	0.12	0.1	0.00
5920002276179	Fuse Cartridge	20	EA	0.12	0.1	0.00
5920002287882	Fuse Cartridge	20	EA	0.12	0.1	0.00
5920002433788	Fuse Cartridge 2a Tube Type 1.250" Overall Length 15 Amps	20	EA	0.20	0.1	0.01
5920002804960	Fuse Cartridge 2a Tube Type 1.219" Length 2 Amps 250v Ac/Dc Max	20	EA	0.07	0.1	0.00
5920002808342	Fuse Cartridge	20	EA	0.08	0.1	0.00
5920002808344	Fuse Cartridge	20	EA	0.12	0.1	0.00
5920002809539	Fuse Cartridge	20	EA	0.27	0.1	0.00

**Appendix C**  
**Test and Repair AMAL 692 - Consumables**

NSN	Nomenclature	Qty	UI	Price	UW	UC
5920002846787	Fuse Cartridge A2 Tube Type 1.25in Lg 0.25 In Diameter	20	EA	0.08	0.1	0.00
5920002849220	Fuse Cartridge 2a Tube Type	20	EA	0.12	0.1	0.00
5920002960446	Fuse Cartridge 2a Tube Type 250v AC/DC Maximum	20	EA	0.08	0.1	0.00
5920007752273	Fuse Cartridge	20	EA	0.30	0.1	0.00
5920008754100	Fuse Holder	24	EA	2.36	0.01	0.01
5920001006135	Fuse, .16 Amp	5	EA	1.00	0.001	0.00
5925012953211	Circuit Breaker E.L. 6515001376511 Electrosurgical Apparatus	2	EA	151.05	0.15	0.01
5930000571583	Switch, Thermostatic	2	EA	136.35	1.75	0.06
5930009032170	Switch, Thermostatic	2	EA	50.47	0.02	0.02
5930001006102	Relay, Compressor (Reefer)	2	EA	25.00	0.01	0.01
5930012835526	Switch Sensitive Used On Centrifuge 6640010689612	2	EA	5.10	0.72	0.01
5930013236499	Switch Toggle End Item Electrosurgical Apparatus	1	EA	15.83	0.55	0.01
5935001488189	Connector Receptacle Elec 9k Str Shape Duplex White 2-Pole	6	EA	15.15	0.02	0.00
5935001488190	Connector Plug Elec 2.671" H 1.531" O/A Dia 125 Volts 15 Amps	24	EA	8.66	0.02	0.00
5935001006108	Adapter, Active, Electrode	2	EA	38.80	0.1	0.10
5935010052323	Connector Plug Electrical 6c Straight Shape With Clamp	2	EA	3.30	0.1	0.00
5940005621829	Terminal Kit	3	KT	55.46	3	0.07
5961001463941	Transistor	6	EA	1.02	0.001	0.00
5961001621819	Transistor	6	EA	0.61	0.001	0.00
5961002789620	Semi Conductor Device, Diode	6	EA	0.45	0.001	0.00
5961003508230	Transistor	6	EA	0.79	0.001	0.00
5961004733162	Transistor	6	EA	0.47	0.001	0.00
5961004733163	Transistor	6	EA	0.50	0.001	0.00
5961005844527	Semi Conductor Device, Diode	6	EA	0.28	0.001	0.00
5961009576865	Semi Conductor Device, Diode	6	EA	0.68	0.001	0.00
5961010437551	Transistor	6	EA	1.33	0.001	0.00
5961010681961	Transistor	6	EA	1.31	0.001	0.00
5961010708942	Semi Conductor Device, Diode	6	EA	0.35	0.001	0.00
5970010245141	Sleeving Set	1	SE			
5975000742072	Strap Tiedown Electrical Components Plus 50lb Minimum Strength	3	HD	0.93	0.4	0.03
5975001113208	Strap Tiedown Electrical Components	3	HD	1.00	0.1	0.00
5975002464906	Bushing, Strain Reli	50	EA	0.04	0.01	0.00

**Appendix C**  
**Test and Repair AMAL 692 - Consumables**

NSN	Nomenclature	Qty	UI	Price	UW	UC
5975003516114	Bushing Strain Reli	25	EA	0.04	0.1	0.00
5975001006110	Transistor, Fbsb178	2	EA	90.28	0.001	0.00
6105002265419	Motor, Alternating C	2	EA	20.76	50	2.25
6145002840630	Wire Electrical	1	SL	4.41	2.2	0.04
6145005482962	Wire Electrical Stranded Single Conductor	500	FT	0.01	3.5	0.08
6210013236563	Indicator Light End Item Electrosurgical Apparatus	2	EA	8.58	0.12	0.01
6210013236564	Indicator Light End Item Electrosurgical Apparatus	2	EA	0.98	0.11	0.01
6240011177150	Lamp Incandescent A65a Miniature Two Pin Base 20watts 6volts	20	EA	6.06	0.02	0.00
6515013236623	Electrode Electrosurgical Apparatus Ball Electrode Disposable	12	EA	139.44	0.1	0.00
6530001006138	Gear Box Assy	1	EA			
6530001006139	Hinge, Slotted OR Table	1	EA	500.00	0.1	0.20
6530001006140	Pawl, Head Rest OR Table	1	EA	200.00	0.5	0.20
6530001006141	Brace Fitting OR Light	1	EA	200.00	0.5	0.20
6530001006142	Hand Crank Assembly Or Table	1	EA			
6530001006143	Strap OR Table	4	EA	35.50	0.01	0.01
6530001006144	Thumb Screw OR Table	24	EA	2.00	0.01	0.01
6530001006145	Litter, Cup OR Table	8	EA	110.00	0.2	0.20
6530001006146	Inner Fitting OR Table	4	EA	158.00	0.2	0.20
6530001006147	Outer Fitting OR Table	4	EA	158.00	0.2	0.20
6530001006148	Wrist Let, Support OR Table	4	EA	75.63	0.2	0.20
6530001006149	Strap OR Table	4	EA	48.55	0.2	0.20
6530001006150	Rib OR Light	3	EA	20.00	0.1	0.10
6530001006151	Bracket, Glass Retainer OR Light	1	EA	50.00	0.1	0.10
6530001006152	Stud OR Light	2	EA	48.75	0.1	0.10
6530001006154	Handle, Position Or Table	4	EA	69.34	0.2	0.20
6545012567036	Parts Kit Apparatus X-Ray (End Item 6525-01-244-0194)	1	EA	53189.49	100	9.98
6545013576899	Parts Kit Processing Machine Rad Film Auto E.I. NSN 6525013456089 (Need To Check Further)	1	EA	2108.62	7	0.01
6545014133144	Parts Kit Xray Apparatus Low Capacity Portable E.I.6525012005800	1	EA	999.99	10	5.00
6545014133148	Parts Kit Xray Apparatus Low Capacity Portable E.I.6525012005800	1	EA	999.99	10	5.00
6640001006162	Boot Rubber (Centrifuge)	8	EA	1.00	0.001	0.00
6640012843119	Cover Centrifuge W/Gasket F/NSN 6640-01-068-9612	2	EA	46.51	0.1	0.00

**Appendix C**  
**Test and Repair AMAL 692 - Consumables**

NSN	Nomenclature	Qty	UI	Price	UW	UC
6685012687046	Thermometer Self-Indicating Bimetallic Dial 0-50deg C Glass Face	5	EA	70.27	0.1	0.00
6685012914391	Gage Pressure Dial	3	EA	74.22	1	0.01
6850009354068	Leak Detection Fluid 12 4oz Bt	1	BX	24.64	1	0.00
8030008893535	Tape Antiseizing Polytetrafluoro-Ethylene Unfused White 1/2x260in	7	EA	0.71	1	0.01
8040008339563	Adhesive Resin Synthetic Silicone Rubber White Paste 5 Oz	12	KT	2.96	0.1	0.00
8040009419984	Adhesive, Rtv Red	3	KT	7.61	0.5	0.02
9150002617899	Penetrating Oil 1 Pt	2	PT	1.34	1.2	0.05
9150002618146	Lubricating Oil, Gen	8	OZ	0.66	0.062	0.01
NSN Pending	12-Compartment Drawer (Kar Products Part No. 99034)	4	EA	12.64		
NSN Pending	24-Compartment Drawer (Kar Products Part No. 99008)	12	EA	12.73		
NSN Pending	4-Drawer Heavy-Duty Roller Rack (Kar Products, Part No. 99114)	4	EA	52.04		3.00
NSN Pending	Grease Gp Bearing Grease					
NSN Pending	O2 Sensor/Monitor (E.I. Anesth App)	4	EA	176.00		
NSN Pending	Tube, Corrugated, 22mmx12in Long (E.I. Anesth App)	1	EA	32.00		
<b>Dental Items</b>						
4310013236636*	Pneumatic Muffler Exhaust-Intake End Item 6540001391246	5	EA	3.00	1.15	0.012
4720012957199*	Hose Air Duct E.I. 6520001391246 Compressor-Dehydrator Dental	6	EA	9.11	1.55	0.012
4720013000515*	Tubing Nonmetallic E.I. 6520012724531den Operating & Treatment Unit	30	FT	0.61	1.15	0.012
4720013256580*	Tubing Nonmetallic End Item 6520012724531 Dental Operating Unit	20	FT	1.00	0.89	0.012
4720013256581*	Tubing Nonmetallic End Item 6520012724531 Dental Operating Unit	20	FT	0.82	0.92	0.012
4720013256582*	Tubing Nonmetallic End Item 6520012724531 Dental Operating Unit	20	FT	0.16	0.89	0.012
4730012027021*	Clamp, Hose	10	EA	1.00	0.01	0.01
4820013236524*	Valve Regulating Fluid Pressure End Item 6540001391246	3	EA	38.10	0.85	0.012
5930001006131*	Motor, Amalgamator	2	EA	29.24	3	0.25
5930013236498*	Switch Pressure End Item 6520001391246 Compressor-Dehydrator	2	EA	447.49	0.88	0.012
6240001517628*	Replacement Bulb For Xray Viewer?	2	EA	Not Avail.	Dental	
6520001006122*	Handpiece, Avs (Dental)	2	EA	50.00	0.1	0.1
6520012511878*	Arm Repair Assembly Amalgamator 2" W 4.375in H E.I. 6530011490123	4	EA	21.66	0.13	0.009
6520012957503*	Regulator Water Den Operating & Treat Unit E.I. 6520012724531	2	EA	22.35	2.3	0.001
6520013236541*	Jar Cylinder Dental 1/2 Gal Capacity Waste	2	EA	15.43	1	0.5
6520013257599*	Reservoir Water Den Operating & Treat Unit Field E.I. 6520012724531	2	EA	75.00	1	0.4
6525001006134*	Cone, Long Head, Dental X-Ray	1	EA	100.00	2	0.5

**Appendix C**  
**Test and Repair AMAL 692 - Consumables**

NSN	Nomenclature	Qty	UI	Price	UW	UC
6545013236537*	Kit Field Dental Repair End Item Cage 51840	2	EA	421.39	1.2	0.003
6635013236641*	Detector Moisture Content E.I. NSN 6520001391246 Compressor	12	EA	0.88	0.2	0.2
9330001006127*	Tubing, Gray, Plastic, Dental	20	FT	1.00	0.1	0.1

\* Items proposed for inclusion in separate can for dental supplies

## REPORT DOCUMENTATION PAGE

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### 13. SUPPLEMENTARY NOTES

### 14. ABSTRACT (maximum 200 words)

The purpose of evaluating test and repair (T&R) Authorized Medical Allowance List (AMAL) 691—Equipment and AMAL 692—Consumables is to ensure that T&R is capable of maintaining the biomedical equipment contained in other surgical company AMALs. Each line item was researched to determine what it is used for, whether it is current, and whether it is redundant. Subject matter experts were recruited from T&R commands to serve as consultants. They participated in meetings and were available to provide assistance by phone or e-mail. Analysis of the T&R AMALs resulted in recommendations for extensive changes to the contents of AMALs 691 and 692. These changes represent an effort to update the AMALs so that T&R is in a state of operational readiness, capable of performing testing, calibration, and repair of surgical company biomedical equipment. Recommendations for improving the process of updating the T&R AMALs include, (1) adding the National Stock Number of the end-item (the biomedical equipment in other AMALs) to the nomenclature of the T&R AMALs; (2) developing Authorized Parts Lists (APLs) for new biomedical equipment; and (3) developing a database that links T&R items, APLs, and equipment electronically to make information accessible.

### 15. SUBJECT TERMS

Authorized Medical Allowance List, Test and Repair, Biomedical Equipment Technology

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UNCL	18. NUMBER OF PAGES 27	19a. NAME OF RESPONSIBLE PERSON Commanding Officer
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